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REPORT

SUBJECT New East German Long-Distance Under-ground Cable Network, North and South Sections

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new long-distance underground cable network of the GDR, north and south section, (Nordring and Suedring):

1. Beginning of Construction

Since early 1955, work has been done on the establishment of a new carrier frequency long-distance underground cable network consisting of the long-distance by-pass connections called Ring um Berlin¹ and the long-distance lines in the northern and southern sections of East Germany, called Nordring and Suedring. Construction work has been divided into the following construction phases:

- a. Ring um Berlin, long-distance cable net by-passing Berlin, most of which was completed by late 1956.
- b. Suedring, ring in the southern section of East Germany, planned to be completed during the second Five-Year-Plan (1956-1960).
- c. Nordring, ring in the northern section of East Germany, still in the planning stage as of early 1958, construction planned for the third Five-Year-Plan (1961-1965).

2. Nordring and Suedring

a. Suedring

Construction work was first started on the Suedring because the heavy industry is concentrated in the southern area. Taking into consideration that the Zeuthen carrier-frequency (Traegerfrequenz - TF) station is the initial point of the Suedring, this ring consists of the long-distance

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cables Nos. 162 and 163. Cable No. 162 which closes the ring between Berlin and Frankfurt/Oder, was probably put into operation with V-12 equipment about mid-1958. The Suedring proper begins in Gueldendorf near Frankfurt/Oder with the long-distance cable No. 163 which had been installed as far as Dresden by June 1958. Work on the Dresden-Chemnitz section has been under way since early 1958. The Suedring is planned to be extended beyond Leipzig-Halle as far as Magdeburg and closed with a long-distance cable from Magdeburg to the Potsdam/Wildpark carrier-frequency station by late 1960. The completion of the Suedring with V-60 equipment is planned by the end of the second Five-Year-Plan in 1960.

b. Nordring

The Nordring leading from Magdeburg via Schwerin, Stralsund and Neubrandenburg to Frankfurt/Oder is planned to be established within the framework of the third Five-Year-Plan from 1961 to 1965. Planning work for the Magdeburg-Schwerin section started in early 1958. As of June 1958, the long-distance cable No. 165 leading from Biesenthal to Stralsund was being used as northern connection.

3. Equipment

a. Cables

Eight-pair styroflex cables are to be used for the Nordring and Suedring except for the section between Magdeburg-Potsdam Zeuthen-Frankfurt/Oder. Although HV radio² emphasized the importance of a coaxial cable between Frankfurt/Oder and Dresden, the funds for this cable could not be made available. It is still possible that a styroflex cable with more pairs might be laid in some sections because the number of cores called for by the plan will prove insufficient. It may also be expected that coaxial cables again might be manufactured in the third or fourth Five-Year-Plan. Then, it might be possible to establish a long-distance cable cross of coaxial cables leading from Berlin to the north, south and west.

b. Carrier Frequency Equipment

As of June 1958, only the old Z-8, V-12 and MG-15 systems are available for carrier frequency utilization. The 18-km repeaters are to be installed on the Frankfurt/Oder-Chemnitz section of the Suedring by 1960. The 9-km points will also be connected by cables but they will not be completed for the time being. The section will be equipped with V-60 carrier frequency units as soon as manufacture permits. The 1958/59 plan also provides means for the employment of V-60 equipment on the existing northern line.

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c. Repeater Stations and Carrier Frequency Terminals

A number of now standard repeater stations and carrier frequency terminals will be built for the new long-distance cable network.

4. Initiation of New Carrier Frequency Underground Network

The planned long-distance cable network presumably will replace the old net. According to previous plans, the old long-distance cables will not be connected to the new carrier frequency stations, but they will only be used in Bezirk traffic later.

5. Security Measuresa. Measures in Case of War(1) Emergency Reserves

The telephone supply departments allegedly have some material reserves for emergency cases.

(2) Secondary Lines

All long-distance cables leading in eastern and western directions are provided with secondary lines at all important bridge and river crossings. The secondary lines near the bridges in Central Germany, (Bezirk Chemnitz, Leipzig, Halle, Magdeburg) are still in the planning stage. There is a secondary line crossing the Elbe River bridge near Wittenberg which was laid before 1939. Several secondary lines are under construction or have already been completed in the Berlin area, in the northern section of the Soviet Zone of Germany and at the eastern border crossing points.

In order to insure trouble-free operation of such secondary lines, traffic is conducted on some wires of the cable. In the planning of all new cabling (coil-loaded cables and carrier frequency cables), the laying of secondary lines at river crossings and bridges is mandatory. This applies in the first place to the new carrier frequency underground cable network.

(3) By-Pass Communications

The by-pass system called Ring um Berlin has generally been completed. Furthermore, it was planned to construct a ring cable system around all larger towns, but this project has so far been frustrated by the shortage of material and funds. It appears possible, however,

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that such ring lines will no longer be necessary since the new carrier frequency cable system will be equipped with repeater stations located at the town fringes, far from industrial installations and thus providing for relatively safe operation of the net in case of town destruction.

(4) Emergency Line-Keeper

In emergency cases, all long-distance cables and overhead lines are to be controlled and safeguarded day and night by line-keepers. It is planned to subdivide the routes in 30-km sections with patrolling personnel stationed in the middle of each section. It has not yet been decided whether these personnel will be equipped with bicycles or motor vehicles.

(5) Mobile Microwave Equipment

In 1953, some 7 or 8 mobile microwave stations equipped with stand-by generators, kitchen equipment, living quarters, and tank truck were introduced for emergency cases. They were employed in the Chemnitz area during the flood some years ago when many cables were under water. These stations which had been procured by the Amt fuer Fernnetze were later subordinated to the Ministry of the Interior. The Postal Service is allegedly not in possession of any mobile microwave installations.

(6) Repeater stations

The important repeater stations, in particular those on the East-West lines will be provided with perimeter cables. Perimeter cables are being planned for the repeater stations at Anklam, Neubrandenburg and Biesenthal. The plan provides that a number of wires branch off at intervals of 500 to 1,000 m from the installed long-distance and Bezirk cables and lead to a central and specially established cable pit which can be connected to a mobile repeater station if the stationary repeater station is out of operation.

(7) Cables

GDR experts believe that the north-south cables do not need the same strict security measures as the east-west cables. Therefore, the former cables were restored in the same way as they had formerly been, i.e. all wires in the cellars of the repeater stations were connected.

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b. General Security Measures

The cable lead-in pits in front of the repeater stations and telephone central offices have again been secured e.g., by a locked chain. The cable pits located north and south of Bitterfeld are equipped with warning systems directly connected to the nearest police station. Visitors to repeater station have to produce a special permit indicating the objective of their visit and showing special approval by the chief of the station involved. Furthermore, each visitor must put down his name in the admission book. The taking of photographs is strictly prohibited and, before entering the station, cameras must be deposited at the security office. The doors to the control rooms of repeater stations cannot be opened from the outside.

6. Cable Production in East Germanya. Long-distance cables

Long-distance cables have been manufactured in the VEB Kabelwerk Oberspree (KWO) (Oberspree Cable Plant), while the other cable plants in the DDR, such as Kabelwerk Koepenick and Meisser were not in a position to manufacture such cables in early 1958. Carrier frequency cables and river cables are now being produced in lengths of 231 m and 160 m respectively. KWO cannot manufacture cables with a standard length of 426 m since the container of the lead press cannot hold enough lead and a refilling of the container is not possible during the manufacturing procedure because the styroflex insulation is highly sensitive to heat.

KWO has plans to resume the manufacture of coaxial cables which had temporarily been stopped because it was unprofitable, and to rebuild the destroyed workshop which is to be equipped with machinery required for the manufacture of 4-tube cables. These plans have been initiated by a decision of the Ministry for Postal and Telecommunications to improve the means of international communications with the East Bloc countries.

b. Local and Bezirk Cables

In the Soviet Zone of Germany, KWO succeeded for the first time in 1957 in manufacturing the Dieselhorst-Martin procedure low frequency cables with an increased number of pairs. Up to 166-pair cables have been produced. The technical equipment for the manufacture of 233-pair cables has not yet been completed.

An order for 22-pair combined cables placed with the Kabelwerk Koepenick could be carried out only with great difficulties. Designing work was done by the Amt fuer Fernnetze since the designing engineers of the plant do not have the required knowledge in this field. During the manufacturing procedures, there were difficulties with regard to the exact fitting lengths.

c. Material

All underground cables manufactured in the Soviet Zone of Germany have hoop-iron sheathing. There is a bottleneck in steel wire, in particular profile wire, as well as styroflex material. The Amt fuer Fernnetze must submit its requirements about one year in advance in order to have the deliveries guaranteed. In 1956 and 1957, there

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were difficulties in the procurement of styroflex material because the DIA (Deutsche Import-Export - East German Import-Export agency) had sold to Poland the available material as a result of faulty planning. The requirements of East Germany could not be met by the styroflex material manufactured by a nationalized plant near Chemnitz. This caused serious shortages in the 1956 cable production of KWO.

d. New Cable Sheathings

Cables with aluminum sheathing have not been manufactured in East Germany. Experimental manufacture was started of local cables with plastic sheathing which were experimentally laid in individual local networks in 1957. The Amt fuer Fernnetze has not yet shown such interest in cables with plastic sheathing.

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Comment: The long-distance cable network in East Germany, though rather outdated from the Western point of view, apparently meets the greatly reduced civilian requirements of East Germany. The establishment of the new long-distance underground cable network was presumably only feasible for the military and the armaments industry. This assumption is supported by the order or succession or construction stages.

All the elements of the civilian telephone network which might be required in case of emergency have been restored for such utilization at fairly high cost compared to other investments.

The production of efficient carrier frequency equipment for full utilization of the new cables is proceeding slowly. The available stock of equipment will be sufficient for the telephone communications in case of emergency, provided that satisfaction of civilian requirements be postponed.

Comment: Annex 1 lists and describes the cables in the carrier frequency long-distance net

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1.

2.

Comment: Main Administration for Radio and Television (HV Radio and Fernsehtechnik) of the Ministry of Post and Telecommunications.

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Annex 1

Long-distance cables Nos

- 16 Old Berlin-Stettin cable, is to be dismantled.
- 26 Old cable dating back to the time before 1945. Cable runs south of Frankfurt/Oder via Fuerstenberg to Guben where, together with the secondary line, it crosses the Neisse River extending into Polish-occupied German territory.
- 29 Berlin-Hamburg long-distance cable, is to be connected to all wire pairs in the cellars of the repeater stations at Friesack, Perleberg and Vellahn.

Construction of secondary lines at bridges crossing waterways in the Nauen, Friesack and Grabow area is under way. Secondary lines, financed by Ministry of the Interior, will be laid underground 30 meters from the bridge edges.

- 60 Two-way, 168-pair old cable dating back to the time before 1945.

The cable with all wires is inserted in the connection to Strausberg, then extends via-Letschin and Kleinitz across the Oder River into Poland. The Oder River crossing is a 3-way type, the individual ways being about 50 meters apart, the cables being laid 3 meters under the river bed. This work was done by the Poles with a former German cable dredger. The exact course of the cable in the Muencheberg area is not known. Later on, the cable was apparently laid as far as Muencheberg.

- 71 Old Berlin-Stettin cable. Since there is little telephone traffic to Stettin, only a few circuits of the cable have been connected. A circuit control for military units exists in Kerkow (Angermuende).
- 99 After 1945, the cable was dismantled in the Soviet-occupied German territory and only the two frequency connections remained in operation in the Polish-occupied German territory.
- In early 1958, the Poles established 60 kcps connection and intended to install Z-8 equipment. In the meantime, some quads of the cable have allegedly been separated and connected to the composite 231-pair local and long-distance cable which had been laid from Frankfurt/Oder to the Gueldenhof carrier frequency station in 1957. A three-way connection was laid over the Oder River crossing.
- 100 63-pair long-distance cable, dismantled in the Soviet-occupied German territory after 1945. In the Polish-occupied German territory, the cable led to Frankfurt/Oder;

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the first and secondary lines were laid under the Oder River bed in early 1958. The cable is planned to be extended to the Gueldendorf carrier frequency station. The Poles allegedly completed the work in their territory. No information is available on equalization and equipment used.

156
(1 and 2)

8-pair, 2-track paper-insulated cable laid in 1951/52, installed 70 cm underground in the slopes of the roads. Equalization up to 60 kcps. Distance between repeaters 25 - 38 km. The cable is the first 8-pair carrier frequency cable delivered by VEB Kabelwerk Oberspree (KWO) after 1945. The cable was connected to the repeater stations of the Postal Service [redacted] in order to utilize the available stations.

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From Wolgast post office, a branch leads to Wolgast naval headquarters. Originally, the cable had been laid for naval purposes only, but after the transfer to Rostock of the naval headquarters, it has been mainly used by the postal service. For the time being, the cable serves as northern section of the underground network. The 1958/1959 budget includes funds for the installation of V-60 equipment on this section. The 18-km repeaters are in the planning stage.

162
(1 and 2)

2-track cable, presently equipped with V-12.

The coaxial cable of form 17 A and 17 B respectively is 3.33/12.7 mm and 3.4/12.7 mm in diameter. The change from form 17 A to 17 B was effected in order to reduce the characteristic impedance from 75 to 70 Ω. The cable was manufactured by KWO which, however, stopped the production of coaxial cables because of unprofitableness caused by the lack of automatic regulating equipment. In 1956/57 the cable was laid along by-roads in a depth of 1-1.2 m. The exact course of the cable is not known. Over-ground work for the intermediate repeaters was completed in 1957. Technical installation was scheduled to be done in 1958. The 9-km repeater stations will not be built in the near future. The 18-km repeater stations are located in the Spreehagen and Biegen areas. The 35-km repeater station which was improved as air-raid shelter, is located in Petersdorf near Fuerstenwalde. The carrier frequency terminal is located near Gueldendorf-Frankfurt/Oder. The line, equipped with V-12 units was probably put into operation in mid-1958. Construction expenses of the line including equalization to 552 kcps amounted to about 65,000 DME per kilometer, including 22,800 DME per km/cable ex factory.

163
(1 and 2)

8-pair, 2 track styroflex-insulated cable laid on the Gueldendorf-Radebeul line between Sept. 1957 and 5 Mar 1958, completed 50 percent. There are plans to utilize V-60 equipment with unmanned intermediate repeaters. At the same time, small additional cables were laid to Muehlrose and Beeskow. The exact course of the cable is not known.

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It is installed 1.2 meters underground avoiding main streets except for the Ruhland-Radebeul section where the highway had to be shifted because of the coal mine along the Autobahn. The total expense for the laying and mounting of 1 km. two-track cable amounts to come 50,000 to 60,000 DM for the cable. The Frankfurt/Oder - Madlow line is about 83 km long. The cable was connected to the 9-km and 18-km points. In early 1958, the terrain for the intermediate repeaters had been purchased. The containers for the unmanned underground intermediate repeaters were planned to be installed in 1958.

- Design of 8-pair cable: star twisted wires 1.2 - 1.4 mm in diameter, cable core covered by following layers: overlapping styroflex insulating band, overlapping paper band, band of copper foil, and absorbant paper layer, lead sheathing 1.5 - 2 mm and the usual hoop-iron and jute sheathings. Sometimes, the paper layer between the styroflex layer and the copper foil is omitted.
- Cable laying procedure: A special trenching machine with a so-called guide collar and rollers, which was borrowed from the Schwerin Wasserwirtschaft, was used for the first time on the Frankfurt/Oder cable route on the section in line with Cottbus. The so-called guide collar is designed for holding the excavated earth until the cable is laid. By this procedure, several cables can be laid straight and at the same time.
- Long-Distance cables
- A This cable, which has the same cable form and equipment as cable No. 163, is to continue the Suedring from Radebeul to Chemnitz-Markersdorf (carrier frequency terminal) via Reital-Rabenau-Brand-Erbisdorf-Oederan-Erdmannsdorf. Laying work was under way in early 1958.
 - B This cable, which has the same cable form as cable No. 163 is to continue the Suedring from Markersdorf to Leipzig-Holzhausen. (Carrier frequency terminal). The cable had already been delivered and was planned to be laid in 1958. Installation work will probably start in 1959. The cable course was not known.
 - C Besides the 8-pair carrier frequency long-distance cable from Dresden to Chemnitz-Leipzig, a 17-pair styroflex cable with coaxial core is planned to be laid from Dresden via Belgern to Leipzig.
 - D This cable, which has the same cable form as cable No. 163, is planned to continue the Suedring from Holzhausen via Halle (location of carrier frequency terminal still unknown) to Magdeburg-Moeser (carrier frequency terminal).

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Planning work was completed in early 1958. Laying work is scheduled to be terminated by late 1960 (second Five-Year Plan).

E This cable is scheduled to connect the Hooser carrier frequency station with the Wildpark carrier frequency station by late 1960. Projecting work was not yet ordered. There were plans to lay either a 14-pair, two-track styroflex cable or a 17-pair styroflex cable with coaxial core.

F The cable form for the section along the Nordring was not determined in early 1958, but there were plans to lay an 8-pair styroflex two-track cable as along the Suedring. Since this number of wires will be insufficient, some sections will probably be provided with a 17-pair styroflex carrier frequency cable with coaxial core. The planned cable course will lead from Hooser via Genthin-Havelberg-Bad Milsnack-Crabow-Lewitz-Miesen-Stoerkanal to Schwerin as far as the Raben-Steinfeld carrier frequency terminal. This course was in the planning stage in early 1958. The continuation of the Nordring is planned to lead via Rostock-Strolsund-Reubrandenburg as far as the Gueldendorf carrier frequency terminal station.

G A new long-distance cable is planned to connect Halle and Erfurt. Further details unknown.

Telelink
cables

1 231-pair combined local and long-distance cable from Frankfurt/Oder to Gueldendorf, laid in 1957.

2 6-pair paper-insulated cable connecting the Polish overhead lines with the Gueldendorf station. This cable together with the long-distance cable No 10 was laid in the Oder River bed with a second cable doubling the line across the river.

3 200-pair combined local and long-distance cable laid in 1957 and scheduled to be installed in 1958. This cable form is generally to be used for connecting the carrier frequency terminal stations with the local trunk exchanges.

4 8-pair paper-insulated cable with an equalization of up to 60 kcps, laid at an u/i da c. This cable continues in the Polish-occupied German territory on uncoiled squads of a long-distance cable with u/i number.

233 This cable leads into the Polish-occupied German territory near Goerlitz. Details unknown.

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Overhead
Line

a

This overhead line with 2 carrier frequency and 3 low frequency speaking circuits leads through the Polish occupied German territory into Poland and is connected to the Gueldendorf station via the C-pair Bezirk cable

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Carrier
Frequency
Terminal
Stations
(TF-Endant)
Southern

This is the initial point for the cables of the Sudring. The station, built by the prefabricated parts system, was completed in late September 1955. The basement with a 1-meter-thick reinforced concrete ceiling is large enough to house all the technical equipment, but a second underground floor is missing. Additional buildings are planned to be built for the additional technical equipment. According to plans of the Ministry for Postal and Telecommunications (MPF) dating back to June 1958, the station is to be improved as junction center for the international telecommunication traffic (transit function center).

Gueldendorf
(Frankfurt/
Oder)

The carrier frequency terminal station for Frankfurt/Oder is located in a wooded area west of Gueldendorf. Construction work was started in 1956/57 and installation of the technical equipment was begun about August 1958. This station is the first one with a two-story basement. Gueldendorf station is scheduled to become the junction centre for a number of connections to Poland.

Madow
(Cottbus)

The carrier frequency terminal station for Cottbus is located at Madow where the previously available station was improved.

Radebeul
(Dresden)

The carrier frequency terminal station for Dresden is located at Radebeul where construction work was started in the fall of 1957. Installation of the technical equipment will probably not be possible before 1959.

Markersdorf
(Chemnitz)

The carrier frequency terminal station for Chemnitz has allegedly been under construction in Markersdorf since mid-1958.

Holzhausen
(Leipzig)

The carrier frequency terminal station for Leipzig was planned to be established in Holzhausen. The building was in the planning stage in early 1958 and now is under construction.

Halle

The location of the carrier frequency terminal station is not known.

Moeser
(Magdeburg)

The carrier frequency terminal station for Magdeburg is planned to be built at the intersection of the Magdeburg Burg road and the Autobahn. This station had already been planned for that section of the Sudring which had been in the planning stage in 1956.

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Wildpark The older carrier frequency terminal station in Wildpark
(Potsdam) has been enlarged.

Raben-Steinfeld The carrier frequency terminal station for Schwerin is
(Schwerin) planned to be located in a wood in the Raben-Steinfeld
 area about 500 meters from the ferry bridge over the
 Stoer Canal east of the road.

New Repeater Stations

The new repeater stations are to be of uniform design projected by the design office of the Deutsche Post which is housed in the building of the Amt fuer Fernnetze. These stations will cover a terrain of 10,000 to 20,000 square meters, the building proper covering some 15 x 30-40 meters and with two underground levels 9 to 10 meters deep. The lower chamber is completely buried and divided by solid walls into various rooms. The upper chamber, though sub-surface, receives daylight through large windows on one side by a slanted shaft leading to the surface. The windows are fitted with iron shutters to be closed in case of emergency while the shaft will be filled up with earth. This chamber has no partition walls but supporting columns. The above-ground structure is single-storied with a hip roof and built-out attic. The lower underground chamber contains the cable inlet, heating plant, battery, power and emergency power supply. The upper underground chamber contains the carrier frequency and TV equipment. The ground floor contains the cable junction office, the telegraph and low frequency equipment. The attic contains the foreman's quarters as well as auxiliary rooms. This type building is to be constructed wherever the terrain permits. Otherwise there will be one single underground chamber with floor space increased accordingly.

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